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# ROBERT GUILD

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October 17, 2008



Mr. Charles Terreni
Chief Clerk
Public Service Commission of South Carolina
Synergy business Park, Saluda Building
101 Executive Center Drive
Columbia, SC 29210

In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina
Docket No. 2008-196-E

Dear Mr. Terreni:

Enclosed please find for filing and consideration twenty-five (25) copies of the Direct Testimony and Exhibits of Nancy Brockway on behalf of Friends of the Earth, together with Certificate of Service reflecting service upon all parties of record.

With kind regards I am

Sincerely,

Robert Guild

Encl.s
CC: All Parties

RETURN DATE: 01 D. Duke
SERVICE: 01 D. Duke

STATE OF SOUTH CAROLINA )

(Caption of Case)
In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsv )

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET
NUMBER: 2008 - 196 - E

(Please type or print)


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NOTE: The cover sheet and information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. This form is required for use by the Public Service Commission of South Carolina for the purpose of docketing and must be filled out completely.

## DOCKETING INFORMATION (Check all that apply)

☐ Emergency Relief demanded in petition ☐ Request for item to be placed on Commission's Agenda expeditiously

☐ Other:

### INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

### NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☒ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☒ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatior
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2008-196-E



In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina

CERTIFICATE OF SERVICE

I hereby certify that on this date I served the above Direct Testimony and Exhibits of Nancy Brockway by placing copies of same in the United States Mail, first-class postage prepaid, addressed to:

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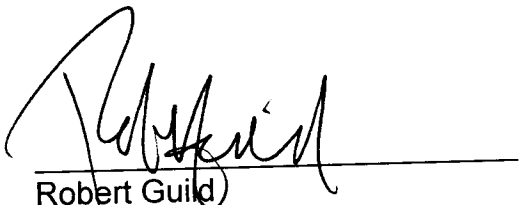
October 17, 2008



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**BEFORE**
**THE PUBLIC SERVICE COMMISSION**
**OF**
**SOUTH CAROLINA**
**DOCKET NO. 2008-196-E**

| | | |
|---|---|---|
| In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina | ) | **DIRECT TESTIMONY OF NANCY BROCKWAY** |

October 17, 2008

**Q. Please state your name, affiliation and address.**

A. My name is Nancy Brockway. I am the principal of NBrockway & Associates, 10 Allen Street, Boston, MA 02131.

**Q. On whose behalf are you testifying in this proceeding?**

A. My testimony is being filed by Intervenor Friends of the Earth.

**Q. Please describe your qualifications.**

A. Since 1983, my professional focus has been the energy and utility industries, with particular attention to the role of regulation in the protection of consumers and the environment, energy efficiency, and the balance between the interests of the utility and those of other stakeholders. I was a member of the staff of the Maine Public Utilities Commission from 1983 to 1986. I joined the Massachusetts Department of Public Utilities in 1986 as a staff attorney and hearing officer. I became Assistant General Counsel, and in 1989 I was appointed General Counsel, a position I held until 1991.

From 1991 until 1998, I was a consultant and expert witness for consumers with the National Consumer Law Center. During this period, I was a member of the Massachusetts Energy Facilities Siting Council. In October, 1998, I was appointed to the New Hampshire Public Utilities Commission. I served as a Commissioner until October 2003. While on the New Hampshire Commission, I was a member of several NARUC committees, including the Committee on Energy Resources and the

Environment, and the Committee on Competition in the Electric Industry. I was Vice-Chair of the Committee on Consumer Affairs. I was a member of the ISO-NE Advisory Committee, and the NEPOOL Appeals Board Advisory Committee.

Since leaving the New Hampshire Commission, I have provided representation and consulting services to the Kansas, Ohio, Delaware, Hawaii and Vermont commissions, and the Utility and Review Board of Nova Scotia, as well as a number of consumer advocate offices and others. In 2007 and 2008, I served as Chief and then Director of Multi-Utility Research and Analysis, on a contract and staff basis respectively, for the National Regulatory Research Institute.

From 2004 to 2008, I served as Chair of the Board of PAYS America, Inc., a non-profit organization devoted to disseminating information about Pay As You Save®, an innovative on-the-bill-financing method to expand markets for energy efficiency.

A resume and list of my previous testimonies is attached as Exhibit NB-1.

**Q. Do you have experience in the field of electricity resource planning, and nuclear generation in particular?**

A. Yes. I have participated in numerous regulatory proceedings involving electricity resource planning, including nuclear power, at various times since 1983. When I was hired by then-Commission Chair Peter A. Bradford to serve as a staff advocate and advisor at the Maine Public

Utilities Commission, one of my first responsibilities was to develop and present staff's position on the prudence of and cost recovery for the Seabrook II nuclear generation station, which had recently been cancelled. At the Maine Commission, I also was lead advocate for the staff in its assessment of the merits of completing Seabrook I, when that plant's support by Wall Street was withdrawn. I also was staff attorney on the team that subsequently negotiated a settlement concerning rates and cost recovery for Seabrook I with Central Maine Power Company, the Maine Joint Owner of the plant. I was a staff advocate assigned to what were among the first Conservation and Load Management dockets in the United States, in which the fundamental regulatory elements of demand side management were developed. I also had responsibility for staff advocacy on non-utility generation dockets under the Public Utilities Regulatory Policies Act of 1978 and state law. I was staff advocate in a number of time-of-use rate design proceedings, involving the theory and practice of this form of demand management. All these proceedings necessarily involved consideration of resource planning, including review of production cost modeling, forecasting and resource selection.

While at the Massachusetts Department of Public Utilities, beginning in 1986, I was the hearing officer and key advisor to the Commission on a number of cases involving generation planning, including nuclear plants. The Massachusetts Commission during this period dealt with ratemaking

treatment for Seabrook I costs for Joint Owners in the Commonwealth, and ratemaking treatment for Pilgrim nuclear generating station in Plymouth, Massachusetts. I presided over the dockets in which the Commission addressed a projected near-term inability to meet objective capacity requirements under the New England Power Pool Agreement, the development of Conservation and Load Management initiatives by Massachusetts utilities, and the PURPA and state law effort to encourage development of independent power production. These proceedings required the a thorough understanding of the resource planning process, alternative resource options, and the treatment of risk in the plant development process.

During my work with the National Consumer Law Center, I continued my work in the area of conservation and load management. I also devoted myself to the study of industry structures, and provided advice to consumer advocates in the ongoing debate about restructuring the electric industry to introduce competition in the generation function.

When I was appointed to the New Hampshire Public Utilities Commission in 1998, the state was in the midst of making a difficult transition to the competitive model for electric supply. Properly valuing assets of the New Hampshire utilities, including their ownership shares in or contract rights to nuclear generation in New England, was an important task of the Commission. The Commission specifically had to evaluate the proposal

for Public Service Company of New Hampshire and other Joint Owners to sell Seabrook Station, a transaction we approved in 2001.

After leaving the New Hampshire Commission, I participated in various demand side management proceedings. In 2008, I researched risk allocation and pre-approval issues for the National Regulatory Research Institute, where I was the Director of Multi-Utility Research and Analysis.

**Q. What is the purpose of your testimony?**

A. The purpose of my testimony is to analyze whether South Carolina Electric and Gas (SCE&G, the Company or the utility) has presented sufficient information to the Commission to warrant a finding of prudence in its current plans to participate with Santee Cooper in constructing two nuclear power generating plants at Jenkinsville, South Carolina, and to make a recommendation as to whether the Commission should approve SCE&G's request for pre-completion cost recovery under the Base Load Review Act.

**Q. How is your testimony organized?**

A. My testimony is organized in four parts. First, I set out the steps a utility should take in order to plan for future resource needs in a prudent manner. Second, I review the steps the Company has taken to develop the plan for which it requests pre-approval in this docket, and set out a number of possible alternatives that deserve more consideration, with particular emphasis on the Demand Side Management (DSM)

alternatives. Third, I set out a number of risks of the current proposal that are not reflected in the Company's current analysis. Finally, I make recommendations about a sound regulatory response to the SCE&G petition.

I also sponsor Exhibits NB-1 (my resume and testimonies), NB-2 (chart showing relative electricity usage in California and nationwide) and NB-3 (chart showing reported DSM savings of a number of utilities).

**Q. Please summarize your conclusions in this docket..**

A. I conclude that the filing does not set forth a sufficient basis to support a finding of the prudence of the Company's nuclear generation plans or support pre-completion cost recovery. There are significant risks associated with the Company's present plan that are not adequately explored or valued in the Company's assessment. There are significant alternatives to the two nuclear generation plants at issue in this docket that are not adequately explored or valued in the Company's assessment. In particular, the Company undervalues solar and wind generation options, and demand side management options. DSM planning by the company is inadequate or altogether lacking, as presented in the application and direct testimony. As to the costs of the nuclear option proposed by the Company, SCE&G has understated the likely costs by a significant margin, and fails to adequately capture the risk of even further increases in such costs. The current financial crisis alone raises serious doubts

about the Company's ability to secure financing for the project, and there are other risks to the Company's ability to secure financing.

**Q. Please summarize your recommendations to the Commission in this docket.**

A. Based on my conclusions and my testimony below, I recommend that the Commission deny the application, and direct the Company to undertake a thorough and complete resource planning process, with suitable stakeholder input. I recommend the Commission order that, if the company chooses to submit a new application, it must contain (a) an adequate DSM and alternative energy analysis, (b) a new and updated cost estimate for all generation options, including the proposed reactor project, ©) a thorough analysis of the financing of the proposal, including all sources of non-ratepayer financing, details of financing for any joint owner, such as Santee Cooper, and the impact of the economic crisis on the financing of the project and the Company's financial health.(d) an explanation of how the Company would proceed if full DOE loan guarantees are not obtained, (e) analysis of the risks to the Company and consumers from a proposal to invest an amount roughly equal to the net worth of the Company, and (f) how the customers would be protected from risks accepted by the Company on their behalf, such as large cost escalations.

If the Commission does not wish to deny the application outright, I recommend that the Commission defer the consideration of any pre-completion approval of the Company's plans under Base Load Review pending (a) a return of the financial markets to solvency and stability, (b) a reassessment of the load forecast and financial analysis underlying the plan in light of recent economic events, ©) an adequate assessment of the risks of the present plan, (d) an adequate assessment of the opportunities for other means to meet (updated) forecast needs, and (e) a full opportunity for stakeholder involvement in the Commission's determination regarding any new proposal the Company may make to construct one or more large central-station nuclear generation plants and obtain pre-approval of any associated costs.

If the Commission determines it is appropriate to proceed forthwith to grant the Company's proposal, I recommend that the Commission make it clear that the Company assumes the risks identified in this docket that pertain to its choice of two nuclear generation facilities. That is, if the Commission approves the Company's proposal for a Base Load Review order, the Commission should determine that no further adjustment to the approved schedule or budget for completion of the plant may be made on account of the risks determined by the Commission to have been inadequately considered by the Company, and that to the extent the Company makes changes to the schedule or the budget as the result of

the occurrence of the factor found to pose such a risk, the Company may not seek an increase in rates or extension of depreciation or amortization to recovery any costs above those approved in this docket. Thus, where the Company has publicly projected that construction, financing and operating costs of the proposed nuclear units will not exceed $6.313 billion, the Commission could condition approval of the application on a prohibition on recovery by the Company of any rates higher than the level projected by the Company in this docket. Stated another way, where the Company has publicly claimed in its advertising that the output from this nuclear project will be electric generation costing ratepayers only 7.5 cents per KWH, it should be held to this promise.

## PART I: ASSESSMENT OF THE COMPANY'S PLANNING PROCESS

**Q. Please describe in general terms the prudent resource planning process for vertically-integrated electric utilities.**

A. Electric utilities have an obligation to serve the public. This obligation is generally understood to include the obligation to forecast the electricity needs of the customers in their service area, and plan to obtain sufficient resources to meet those needs.

The first step in the resource planning process is the determination of need. The first step in determining electricity needs is the preparation of a forecast of the utility's probable loads and energy requirements, assuming no incremental utility intervention on the demand side. Next the utility reviews its current portfolio of resources, to determine which existing resources will be available at which times over the planning horizon. Once the utility has prepared its initial forecast of loads and resources, it determines the amount and timing of any shortfalls between currently forecast resources and forecast energy and demand requirements. The utility then develops an array of all reasonable alternatives to meet any shortfalls so identified. This array includes central station generation using various fuels and technologies (base-load, intermediate and peaking), as well as a variety of forms of dispersed and customer-side generation, and all potential incremental demand-side management

impacts. To be reasonable, the alternatives must enable the utility to meet all its lawful obligations, including environmental and siting constraints, for example.

Once the need is forecast and reasonable alternatives are identified, the utility prepares a number of alternative scenarios, matching different groupings of potential resources to the forecast needs. The utility prepares estimates of the net present value of costs of the various scenarios, performs sensitivity analyses of the cost of the scenarios based on reasonable possibilities of changes in any major component of the estimate (such as load forecast or construction cost forecast, e.g.), performs iterations as the analysis suggests might lead to a superior plan, and identifies the package that will meet the resource needs of the service area at the lowest estimated net present value over the planning horizon, at a reasonable level of risk in light of possible contingencies.

A utility should also engage the public and key stakeholders at all stages of the planning process. Particularly where a planning process is drawn out and takes place in several stages over several months or even years, it is prudent to obtain input from the public and stakeholders on the various processes and results of different stages. Such involvement as the process unfolds averts the situation in which the Company completes an extensive planning process and commits to a certain course of action,

only to receive input from the public and stakeholders that, if considered earlier in the process, could have led the Company to a superior course of action.

**Q. What steps does the Company state that it took to plan for its resource needs, leading up to the present filing?**

A. In 2005, according to Company witness Kevin B. Marsh (p. 18 of his Direct Testimony), SCE&G "began the process of evaluating nuclear generation load options..." By 2005, according to Mr. Marsh, SCE&G had determined that, "to meet its forecasted requirements for new base load generation it would need to make a decision as to the viability of construction nuclear generation in the 2006-2008 time period." A description of the Company process is set forth in more detail in Dr. Lynch's testimony. As I discuss below, it is not clear that the Company performed any serious comparisons of its preferred option to other possible scenarios. In addition, I understand that the Company asked the Commission to defer consideration of its integrated resource plan (or IRP) until the instant proceeding, thus assuring that no public or stakeholder review or Commission approval of its planning process could occur independent of the decision on this nuclear project.

**Q. What do you conclude about the Company's planning process , based on your understanding of the initial sequence of events?**

A. I conclude that the Company has not adequately supported its choice of baseload generation as the best option to meet forecast needs. The Company does not explain how it determined that incremental baseload generation owned by the Company was the preferred option to meet forecast demand and energy requirements, beyond noting its historical reliance on this type of resource. The Company appears to have let its assumption that baseload generation plant would be the best resource to meet future needs dictate its planning from that point forward, without considering, and modeling, scenarios including intermediate and peaking options, including alternative sources of generation, as well as demand side management.

**Q. How did the Company settle on a nuclear generation option?**

A. According to Mr. Marsh and Dr. Lynch, the Company determined it had a window of opportunity expiring in 2008 to assess the nuclear option and to have a nuclear generation solution in place by the time of its forecast capacity shortfall. On this basis, the Company looked at the nuclear option and considered non-nuclear baseload generation options.

**Q. What options did the Company consider besides nuclear generation?**

A. The Company looked at coal and natural gas generation as alternatives to nuclear generation, to meet its forecast resource needs. The Company

states that it had information concerning the costs of coal and gas generation, and accordingly that it focused its evaluation on the nuclear option.

**Q. At what point did the Company begin to pursue the nuclear option in a manner that precluded pursuit of other options?**

A. In 2005. According to Mr. Marsh, the Company initially decided on the Westinghouse AP1000 design in the 2005-2006 time frame. In 2006, SCE&G began its negotiations with the consortium of Westinghouse and Stone & Webster for two AP1000 units. Mr. Byrne states that in 2006-2007 the Company did re-evaluate the choice of the AP1000 design over the General Electric "Economic Simplified Boiling Water Reactor" (ESBWR) and the UniStar/Areva "Evolutionary Power Reactor" (EPR), the competing new nuclear generation designs. Meanwhile, the AP1000 negotiations continued through May 2008, when SCE&G signed the EPC Contract.

**Q. What was the impact on the Company's planning process of its course of negotiations with the AP1000 consortium?**

A. According to Mr. Marsh, the Company put in "several years of intensive study, evaluation and negotiation," leading to the May 2008 signing of the EPC Contract with the AP1000 consortium. The intensity of the study, evaluation and negotiation would have made it difficult for the Company to

pursue any other baseload generation option, much less a more comprehensive, multi-resource approach to meeting its forecast needs. Indeed, the Company does not describe any process by which it reopened the choice of baseload generation, nor the choice of the nuclear option within baseload options. From what appears in the filing, the Company during this period did not consider any non-baseload-generation option, including demand side management or additional off-system purchases. The Company was focused entirely on the nuclear option, and specifically on the AP1000 option.

**Q. At what point did the Company consider non-baseload generation options, including non-utility and renewable generation, as well as demand side management, as resources to meet its forecast requirements?**

A. There is no evidence that the Company seriously considered any alternatives aside from its own baseload generation, and in recent years, nuclear generation. The Company did put together a filing that includes a discussion of its understanding of the merits of these options. However, the non-nuclear options discussion appears to have been an after-the-fact justification of the original decision to focus on baseload nuclear generation, rather than a serious effort to determine all reasonable options.

**Q. How does the Company characterize the alternatives it has rejected?**

A. In general, the Company's filing indicates that it gives insufficient weight to alternatives such as Demand Side Management, wind, solar, and other resources for meeting its anticipated resource needs, particularly in light of today's economic circumstances.

**Q. The Company rejects wind power as an option. Are others in South Carolina seriously considering the wind option?**

A. Yes. For example, Clemson University, Coastal Carolina University and Santee Cooper are working together to perform a South Carolina Coastal Wind Resource Assessment. They are identifying areas where sufficient wind exists to justify installation of wind-powered electricity turbines.

**Q. The Company notes that wind does not always blow at the time when power is needed. Is this a reason to discard the wind option?**

A. No. It is true that the power available from a wind turbine is often much lower than its nameplate capacity. But that does not keep utilities across the country from including wind as an important resource in their portfolio, making the proper adjustments to their estimates of the likely production from the turbines.

**Q. The Company' argues that transmission of wind energy to the Company's load centers would be a cost. Does this not support its rejection of the wind option?**

A. No. First, two of its major load centers, Beaufort and Charleston, are on the coast. Also, the Company will also bear a cost for transmitting its baseload nuclear from the site to its load centers. The relative costs would have to be analyzed in a serious study of the wind option.

**Q. The Company argues that to generate enough energy to displace the proposed AP1000 generation plants, wind generators would have to be placed all along the South Carolina shore. Is this argument sound?**

A. No. The Company here, as in the case of other options, sets up a straw man, by calculating what would be required to displace 2,234 mW of generation. Just because it would be expensive or difficult for any single other source of generation to produce 2,234 mW does not mean that other sources of generation could not be part of a superior alternative portfolio. In addition, the record does not detail Santee Cooper's need for its 1000 mW share of the two nuclear generators, and thus nothing to prove how much more than SCE&G's 1,229 mW needs to be put together to serve the Company's anticipated load.

**Q. The Company rejects solar as an option. Is solar power a realistic option in South Carolina?**

A. It may be that large "central-station" arrays of concentrating solar energy are not the most suitable for South Carolina, at least with present

technology. However, Duke has recently announced that it would buy approximately 16 mW of energy from a large photovoltaic solar farm, which is being built in Davidson County, North Carolina by SunEdison. Also, South Carolina already make use of distributed flat panel solar power, both for direct heating (e.g. water heating) and for photovoltaic generation of electricity. Duke in North Carolina has also proposed to invest $100 million to install photovoltaic solar panels at up to 850 sites in North Carolina, including homes, schools, stores and factories. Thus, a major utility in a close neighbor to South Carolina has chosen to invest in both concentrated and distributed solar power, suggesting there is more potential for such a resource in South Carolina than SCE&G considers viable.

**Q. The Company argues that solar, wind and other renewable resources are more expensive than its proposed nuclear power plant. Do you agree?**

A. No. It is true that renewable sources of power have historically been more expensive than fossil fuel generation, and have produced power at higher costs than nuclear operating costs. However, the costs of alternative forms of power generation are continuing to come down, as society puts more resources into their development. Also, as shown in the next

section, the costs of nuclear power are high, and budgets and estimates for such plants are subject to considerable risk of understating the ultimate cost of such power. Estimates of both sorts of resources must be continually updated to reflect changes in their underlying costs and risks.

**Q. The Company argues that it has exhausted the possibilities for Demand Side Management to avert the need to install two 1,117 mW nuclear power generating plants, and take 55% of the output. Has the Company demonstrated that its DSM potential is insufficient to avert the need for its proposed nuclear investment?**

A. No. The Company's filing shows that its estimate of DSM potential to reduce peak demand goes down by 25 mW from 2008 to 2009, and then stays at this lower level through the planning process. The Company does not justify its apparent determination that as of 2009 it will have exhausted all demand-reduction potential via DSM. Indeed, the Company states that it is exploring with consulting firm ICF the possibilities of increasing its DSM resources. The Company states that demand reduction could not make up for the 1,229 mW of power it says it will need. As with wind and other generation options, this is the wrong test. Rather, the Company should ask whether additional DSM could contribute to a plan that could replace the 1,229 mW of nuclear power the Company has

chosen to obtain. The Company does not ask itself this question, nor answer it.

**Q. Mr. Pickles and Mr. Lynch state that the national average energy reduction from DSM in the United States is 0.58 percent, and in the Southeast the average annual kWh reduction is about 0.36 percent. On this basis, they discuss only a 0.5 percent sales reduction option from DSM for SCE&G. Is this approach sufficient to discount the DSM option?**

A. No. First, averages by definition do not state the maximum possible energy savings, unless all utilities happen to achieve the same level of savings. Some states have achieved dramatically higher levels of savings. For example, through a combination of building and appliance standards and demand-side management programs, California has held its per capital consumption of electricity to roughly 7,000 kWh from 1975 through 2004, compared to the growth from 8,000 kWh to 12,000 kWh in the national average electricity consumption over the same period. See Exhibit NB-2, attached. California has achieved these results without depressing its economic vitality. Second, the lower average kWh savings from utilities in the Southeast is likely the result of the more recent focus on DSM in this region, rather than the fact that it is a warm-weather region. Indeed, the presence of a greater concentration of air conditioning

in the Southeast than some other regions where DSM has been pursued for 25 years or more suggests greater potential for savings in the Southeast than in some less electricity-intensive regions. For example, utilities such as Gulf Power have had success in obtaining demand reductions through their residential air conditioning load control programs, but SCE&G has no such offering. Attached to my testimony as Exhibit NB-3 is a table drawn from EIA data, showing that a number of utilities around the country have been able to harvest significantly more energy and demand savings than the Company acknowledges are possible. While there are differences in service areas, South Carolina still has the potential for considerable cost-effective efficiency investments.

**Q. Are there other reasons to question whether SCE&G has adequately reflected the possibility of Demand Side Management?**

A. Yes. Based on my 25 years of experience in the area of Demand Side Management, it is my opinion that SCE&G has not yet undertaking any significant DSM initiatives. That is, few savings have been harvested compared to the likely technical and economic potential for electricity savings in the service area. The initiatives undertaken by the Company are, with the possible exception of interruptible load rates, not designed in a way likely to produce noticeable energy or demand savings. This

observation further supports my opinion that SCE&G has not adequately counted the potential for meeting future resource needs through DSM.

**Q. On what do you base your opinion that SCE&G has not undertaken any significant DSM initiatives to date?**

A. By "significant DSM initiatives," I mean DSM initiatives that are calculated to save and have saved significant amounts of electricity usage, including usage on peak. SCE&G claims that it has had a DSM program in place for many years, but its program consists of efforts that are not likely to have much success in overcoming the market barriers that keep residential and business customers from investing in the electricity-saving options available.

**Q. How do utility DSM initiatives attain savings that would not appear by operation of the efficiency markets by themselves?**

A. From the beginnings of DSM at the Maine Commission in 1983 to the present, the objective of utility efforts has been to overcome the market barriers (or imperfections) that prevent customers from choosing the efficient option (the efficiency "measure"). There are a number of such barriers. The primary barriers relate to the fact that efficiency measures often have higher upfront costs than less efficient options. This fact in turn causes many customers to choose the less efficient options. Even knowledgeable and interested customers often face such remaining

market barriers as a lack of the cash to pay the higher upfront cost, an inability or unwillingness to undertake debt to pay for the higher upfront cost, a lack of confidence that the measure will work as promised to save the promised energy, and a lack of confidence that they will remain in the premises long enough for a measure to pay back the incremental upfront costs via bill savings.

**Q The Company fields two customer information programs. Do these efforts represent a serious attempt to reduce customer usage (and peak)?**

A. No. Information only programs do not represent a serious attempt to reduce customer usage or peak. DSM evaluators do not even attempt to count savings from information programs - it is not possible to perform a valid evaluation that identifies savings resulting from such programs. Information alone is typically not enough to motivate a choice of the alternative.

**Q. Why do you say that knowledge alone is not enough to motivate customers to choose the efficient alternative?**

A. Information programs address only two of the market barriers customers face when choosing between an efficient option and a less efficient (but less expensive or more familiar) option: lack of knowledge about the alternative, and lack of knowledge about the savings potential of the

alternative. Information overcomes none of the key barriers. It only results in a public that is more aware it is not doing enough, but is no more able to make the incremental investment than before.

**Q. The Company states it also has three conservation programs, Value Visit, Energy Saver Rate and Seasonal Rates. Do these represent serious efforts to harvest energy efficiency?**

A. No. The three initiatives in combination fail to overcome the most important market barriers for most customers, including high upfront costs, inability or unwillingness to take on more debt, and lack of confidence in the achievement of the promised payback. Value Visit adds an upfront barrier, the $25 charge for the audit; this in itself deters many customers in my opinion.

**Q. How does the Company measure the success of its conservation and load management programs?**

A. In its application, Exhibit G, the Company points to three statistics as measures of success of its demand side management programs:

*Almost 200,000 customers are registered for internet access (for efficiency tips);

* Over 50,000 customers are on the Conservation Rate; and

* 20% of commercial sales are served on TOU or RTP rates.

**Q. Do these statistics demonstrate success for these programs?**

A. No. The mere fact of registering for internet access to obtain efficiency guidance tells us nothing about how many registered customers took what actions that have saved what kWh and kW as a result of such access. The number of customers on the Conservation Rate tells us nothing about whether customers would have taken the steps towards efficiency they did without the benefit of the lower rate. The fact of a lower rate (or on-the-bill-financing without more) does not overcome the problem of upfront cost differentials, inability or unwillingness to take on debt, and lack of confidence in the payback of the investments. Thus, many customers who could contribute significant savings cannot take advantage of such offerings. Also, the program relies on a limited range of lower-cost measures, and thus likely does not address the potential for greater savings available with higher levels of investment. The fact that 20% of commercial sales are made on TOU or RTP rates similarly does not demonstrate that the customers taking service on these rates have done anything to change their premises, equipment or processes to achieve greater efficiency or further move load off peak. The Company's statistics measure activity, not results.

**Q. Is there a significant opportunity to expand the amount of energy that could be saved through greater efficiency?**

A. Yes. A variety of studies have suggested that it would be cost effective to substitute efficiency for a much as one-quarter of our electricity usage. In addition, demand side management experts are developing new techniques to overcome some of the persistent market barriers that have limited the extent to which utilities, even in states like California and Vermont with relatively high levels of DSM spending, have been able to harvest all cost-effective efficiency. Renewed attention to the problem of persistent market barriers is likely to expand the range of programs significantly beyond not only the information programs emphasized by the Company, but beyond the incentive and rebate programs that characterize the portfolio of the most successful DSM providers today.

**Q. The Company states that it has filed its DSM plans with the Commission. Should that give the Commission assurance that the plans maximize the harvest of all cost-effective DSM?**

A. No. The Company does not and cannot contend that the Commission has approved its plans, merely because they have been filed.

**Q. Are there other reasons to doubt the Company has done all it can to harvest cost-effective DSM to date?**

A. Yes. First, the Company itself admits that it has only recently hired ICF consulting firm to do a plan for DSM programs, undertaking research and planning that the Company has not undertaken itself or by contract to this

date. ICF's analysis is not scheduled to be presented before the summer of 2009. Also, South Carolina since 1993 has allowed electric utilities to obtain cost recovery for its DSM programs, including the value of its lost revenues and return. SCE&G has not taken advantage of the South Carolina law to propose rates that would implement an effective DSM program.

**Q. Are there advantages to including DSM and smaller, more dispersed generation options in a utility's resource portfolio?**

A. The main advantage of DSM is its low cost relative to the cost of generation. The same dollar of spending on efficiency will produce greater "negawatthours" than the same dollar will produce "megawatthours." Further, DSM and smaller resource options are modular resources. Their contribution can be ramped up and down depending on changing forecast requirements. Such modularity makes it considerably easier to finance these alternatives, relative to a large central-station generation option, nuclear or otherwise.

**Q. What do you conclude about SCE&G's consideration of DSM potential to displace the need for its proposed nuclear reactors?**

A. I conclude that SCE&G has seriously underestimated the contribution to meeting its customers' resource needs that can be made by DSM, and

has chosen a central-station generation alternative before giving DSM, and other options, adequate consideration.

## PART TWO: RISKS OF THE CURRENT PROPOSAL THAT ARE NOT REFLECTED IN THE COMPANY'S CURRENT ANALYSIS.

**Q. Does the Company's analysis of the relative merits of its proposal adequately reflect the costs and risks of its proposal?**

A. No. The Company's analysis of the relative merits of its proposal does not adequately reflect the likely costs of its proposed plant construction, and does not adequately account for a number of risks associated with the commitment to construct two large central-station nuclear generating plants, especially in light of the current economic crisis.

**Q. Please describe the Company's estimate of the costs of the proposed nuclear power plants.**

A. SCE&G proposes to spend at least $6.3 billion, its share of the $9.8 billion it estimates it will cost to construct two 1,117 mW nuclear generation plants, (Application Exh. F). This investment would translate to a(l) cost of $5,138 per kW ($6.3 billion/1,229 mW). It is not possible to develop an estimate of the overnight costs of the plant from the public record.

**Q. How does the Company's cost estimate compare to other recent cost**

**estimates?**

A. The Company's estimate is lower than most estimates recently published:

| Recent Estimates of Nuclear Generation Plant Costs, $/kW (all overnight estimates in 2007$ unless noted) | | |
|---|---|---|
| **Study/Source** | **Overnight Costs** | **All-In Costs*** |
| MIT 2003 (2002$, escalated by CERA PCCI) | $3882 | *$7664* |
| Lazard | | *$6528* |
| Average of DOE Loan Guarantee cost estimates | | $5000 - $6000 |
| Moody's Investor Service | n/a | *$5500 - $8100* |
| FP&L AP1000 (October 2007 application) | $3643 - $4587 | $4300-4550/kW (real) *$8400 nominal* |
| Jim Harding, June 2007 | $4200 | |
| FERC Staff Study cited by S&P October 2008 | | $5,000 - $8,000 |
| Keystone Center | $2950 | $3600 - $4000 |
| Progress Energy, Florida | | $4,229/kW |
| S&P October 2008 | | $4000 |
| SCE&G Exhibit F | | $5138 |
| * As given, or if not stated, derived by doubling overnight cost estimate (and shown in italics) | | |

**Q: What has the DOE recently said about the cost of new nuclear units?**

**A:** On October 2, 2008, the U.S. Department of Energy issued a news release entitled ":DOE Announces Loan Guarantee Applications for Nuclear Power Plant Construction," in which it estimated that construction of 21 nuclear reactors in the U.S. would cost $188 billion, or approximately $9 billion per unit. Though the DOE estimate was independent of the reactor model, this is far above the $9.8 billion presented by SCE&G for two units. Additionally, DOE said

that utilities are asking for an additional $103.5 billion in loan guarantees by the federal government, an amount which has not neither been considered nor approved by Congress.

**Q. What does Moodys Investors Service say about the industry's ability today to estimate its likely costs with accuracy?**

A. Moody's Investors Service is quoted as having released a "special comment" in October 2007, entitled *New Nuclear Generation in the United States: Keeping Options Open vs Addressing An Inevitable Necessity,* in which the ratings agency cautioned that its estimate of the all-in costs of a nuclear plant (between $5000 and $6000/kWe) was "only marginally better than a guess." The report went on to state that the Moody's estimate:

> ...is a *more conservative* estimate than current market estimates...All-in fact-based assessments require some basis for an overnight capital cost estimate, and the shortcomings of simply asserting that capital costs could be 'significantly higher than $3500/kWe' should be supported by some analysis. That said, *Moody's cannot confirm (and all of our research supports our conclusion) definitive estimates for new nuclear costs at this time.* Moody's can assert with confidence that there is considerable uncertainty with respect to the capital cost of new nuclear and coal-fired generating technologies, and that companies may decide not to proceed with financing and construction unless and until they have satisfied themselves (and, where necessary, their boards and regulators) that the investment is justified and that the plant can produce electricity and recover costs at a price that will not be overly burdensome to consumers. (emphasis supplied)

**Q. How does the SCE&G share of the estimated costs of the plant relate to the total estimated cost of the plant?**

A. The Company states that the total costs of the plant are estimated to be $9:8 billion. Santee Cooper will pay 45% of the construction costs and take a corresponding ownership share. The Company will own 55% of the plants and be responsible for a corresponding share of the costs, or $6.3 billion under the Company's estimate of construction costs including AFUDC.

**Q. What schedule does the Company forecast for the completion of the two proposed units?**

A. The Company states that the first of the two units will be brought on line in 2016, and the second of the two units will be brought on line in 2019.

**Q. How reliable is the Company's estimated construction schedule for its two proposed plants?**

A. The Company's schedule for construction of the two proposed nuclear generation plants is subject to a great deal of uncertainty. There is considerable risk that the schedule cannot be met, and it will take much longer to complete the two plants.

**Q. What are the sources of uncertainty in the Company's estimated construction schedule for its two proposed plants?**

A. There are several reasons to doubt that the two power plants proposed by SCE&G can be completed on the schedule contained in the Company's filing. First, the Company proposes to build two Westinghouse AP1000 nuclear power plants. No plant of this design has ever been constructed. When a design of a complex machine like a nuclear power plant is put into bricks and mortar (or concrete and piping) for the very first time, it is common for the engineers, architects and builders to discover design issues that were not apparent in the design process. Addressing these issues can take time, and delay the scheduled completion. This is evidently happening with the new generation nuclear plant being built by Areva for Finland. Second, while the AP1000 design has been pre-certified by the Nuclear Regulatory Commission, that certification does not purport to guarantee that the design is free of flaws or anomalies. Third, the AP1000 design is not yet complete. There is no final design yet, and the design review is now on Revision 17. The NRC has no clear schedule for reaching a final design. There is no guarantee that a design will ever be recognized as final, yet a final design is necessary before the NRC can

issue a Combined Construction and Operating License (COL) to SCE&G. Fourth, it is likely to be 2012 at the earliest before a COL can be issued. The first plant is scheduled to come on line in 2016, a date that is unrealistic given the continued delays in developing a final design for the AP1000. Florida Power & Light, which recently obtained permission to proceed with two AP1000 plants, expects to complete the first of its two plants in 2018. SCE&G does not explain how it can be at least two years ahead of FP&L in completion of its plant. Fourth, if no COL is issued in 2012, there will be further delays, the length of which cannot be predicted. Fifth, large construction projects of any kind are subject to the risk of contractor error. Recall that the NRC approved the designs for Diablo Canyon nuclear station in California, and only after the plant was built in 1981 did engineers discover that the contractor misread the blueprints and constructed the facility in a mirror image of the actual plans. The plant could not be put in service as built. The construction error forced delays in opening the plant.

**Q. How reliable is the Company's estimated construction cost for its proposed plan?**

A. The Company's estimation of construction costs for the two nuclear

generation plants is subject to a great deal of uncertainty. There is considerable risk that the cost to construct the two proposed plants will be much higher than the Company's estimate.

**Q. Please identify the key sources of uncertainty in the Company's estimated construction cost, and associated rate increases to customers.**

A. The most important source of uncertainty in the cost estimate is the uncertainty in the schedule, discussed above. The longer the construction time, the greater the likely escalation in costs of all inputs to the construction process, the greater the risk that intervening changes in NRC requirements will require expensive retrofits of what has already been constructed, and the more the carrying costs of the investment will compound. Another key reason to doubt the Company's cost estimates in this docket is that they rely on forecasts of inflation in the construction of nuclear power plants that are well below the most recent rates of inflation in such construction. Also, the Company assumes it can get federal loan guarantees, whereas there is a limited pot of money that Congress made available, and there is no certainty that SCE&G will obtain the loan guarantees it says it needs. Further, the Company assumes a cost of

capital that does not adequately reflect the added risks of nuclear plant construction. Also, the contingencies included by the Company in the public version of its Application appear to be low in some cases. Finally, the Handy-Whitman index used by the Company to develop escalation estimates shows considerably lower inflation in nuclear plant costs than does the index published by Cambridge Energy Research Associates, suggesting that the project risks considerably higher cost escalation than that reflected in the Company's estimates.

**Q. The Company argues that it has negotiated an EPC contract that limits the risks to consumers from delays in the schedule and other sources of cost escalation. Is this argument sound?**

A. Putting aside the problem that the EPC contract is not public, it is likely that this arrangement with Westinghouse/Stone & Webster (Westinghouse) does not adequately protect SCE&G's customers from sources of cost escalation. First, significant portions of the construction will be priced under a Target Price structure which purports to provide for risk sharing between Westinghouse and the Company, but in fact provides a "profit minimum" assurance to Westinghouse. Exhibit C, pp. 3-4. This provision suggests an asymmetric allocation of risk away from

Westinghouse and on to the customers. Another major portion of costs are subject to escalation, and are not limited by indices or other controls on the rate of escalation. The fact that present-day design/build consortia have institutional memories of the great losses they incurred under turnkey contracts in the first round of nuclear construction suggests it is unlikely that they would allow themselves to be exposed to such high levels of risk. In addition, to the extent of pre-completion cost recovery by the Company from consumers, any risks of the contract are flowed through to consumers, and the Company's incentive to manage the contract carefully to squeeze out all waste and cost overruns is minimized if not eliminated.

**Q. Are there other significant risks for the Company and its consumers from the choice of this two-unit nuclear generation resource option?**

A. Yes, there are several additional risks for the Company and its consumers from SCE&G's choice of this two-unit nuclear generation resource option. First, the security challenges for nuclear plants today are quite different from the situation when South Carolina first supported extensive investments in nuclear power. Second, the Company states that the plants will have 18 years of on-site storage. This will not be enough, even

if the plants do not operate longer than 18 years (recall the Company assumes a 60-year life). Radioactive waste has a half-life of thousands of years. It is true that South Carolina already has a "nuclear waste" challenge, and it could be argued that adding the output of two new plants will not materially affect the magnitude of that challenge. But every metric ton of radioactive waste is another radioactive ton that must be managed and ultimately delivered to a permanent storage facility. (It bears noting that reprocessing will not solve this problem, and creates other problems). And when South Carolina first embarked on its nuclear program, there was reason to expect that the federal government would take over and resolve the waste storage issue in a reasonable time. That reasonable time has long passed, with no permanent storage facility yet in sight. Finally, and perhaps most importantly, the sheer size of the proposed investment, relative to the Company's capitalization, creates enormous risks of inability to secure financing, inability to complete the plant, large stranded costs, and a utility whose capital is weakened for many years. This risk is only magnified by the current economic crisis.

**Q Is it possible to quantify the risk premium associated with the various risks to the Company and its consumers associated with the**

**choice of the two-unit nuclear option?**

A. I cannot quantify the risk premium associated with the various risks to the Company and its consumers associated with the choice of the two-unit nuclear option. I can say, however, that the Massachusetts Institute of Technology in their 2003 study assumed a 3% return on equity risk premium for nuclear generation relative to coal and gas central station generation (Chapter 5, p. 15). MIT did not attempt to estimate the relative risk premium for nuclear plants and more modular resources such as alternative dispersed generation, a more varied portfolio, or demand side management. Whatever the risks of such alternatives, as a group they will have a lower risk profile, because investments in a portfolio of alternatives will not require such a concentration of risk in one project, as does the Company's proposal.

**Q. Please discuss the risks associated with the size of the plant relative to the Company's capitalization.**

A. The Company's current capitalization is just under $5 billion. By 2019, assuming its cost estimates are correct, it will have more than doubled its capital investment. The Company is healthy today, but we saw in the first round of nuclear investments some years ago the impact that such

relatively large investments can have on Company financial indicators. When demand slacked off (in part in response to the very price increases brought about by the investment), costs escalated, and plants were delayed or even cancelled, many utilities in the 1970s and 1980s experienced severe financial distress. A less concentrated, more diverse and modular portfolio of new resources would be much less risky.

**Q. But under the Base Load Review Act, the Company will be able to recover, in effect, most of its Construction Work in Progress (CWIP). Does not this insulate the Company and its consumers from these risks associated with the size of the investment?**

A. No. The Company is not altogether immune from the risks even if it receives current CWIP recovery, and in any event such current recovery merely transfers the risks to consumers. The Company does not adequately explain the level of non-customer financing it will require, assuming it proceeds with its *plans – even with CWIP recovery, and reality meeting all Company expectations, it is possible that the cost of raising the balance of funds will be a stress on the utility, which translates to higher costs of capital. Also, the current cost recovery sought by the Company will induce a reduction of future loads as the result of price

elasticity, undermining the basis for proceeding with the plant. In addition, the extent of price increases will focus public attention on utility rates, and risks the introduction of short-sighted public intervention in ratesetting. Finally, the Company may be protected, but this will only occur by virtue of transferring the risk to consumers. As well, the cost-benefit analysis of the proposal does not take into account the fact that consumers will have an opportunity cost for the capital they must devote to the investment as they pay for the construction in progress.

**Q. How does the current financial and economic crisis in the United States affect the wisdom of continuing on with the Company's two-unit nuclear plant proposal?**

A. The current financial and economic crisis exacerbates the risks that the Company cannot get financing on reasonable terms, that the costs of financing will increase, that customers will cut back on usage and load forecasts will overestimate future demand, and that the need for this or any plant will be pushed back in time, especially as other utilities also see reduced demand and have additional amounts of power to make available to SCE&G. The crisis also puts in question the likelihood of additional federal subsidies for nuclear generation, at least in the short term, as the

result of rising federal deficit *pressures. The logistical and labor constraints for key nuclear plant inputs MAY will likely ease, but to what extent and with what cost ramifications is not clear at present. This easing may reduce cost escalation in the future, but whether it will bring it down to the levels anticipated by the Company is not known. As Standard & Poors noted in a recent research document, there are a number of drivers besides material costs that are pushing up the cost of nuclear plant construction:

> Construction risk is the overriding risk for new nuclear units. *We believe that labor and material cost increases are particularly acute for nuclear plants given their specialized labor needs, material intensity, and a tight supply chain for key components.* The *scanty construction track record* for the new technologies and *an untested regulatory process* only complicate the risks. *The ABWR has an advantage over other technologies* since four have been built and the technology has more than a decade of operating experience. EPR technologies will benefit from the fact that there are two reactors being built in Europe where construction is at least three years ahead of the Calvert Cliffs 3 plant. Thus, U.S. facilities will be able to learn from any difficulties confronted there. It is unclear how much risk technology vendors and construction contractors will be willing to assume in new nuclear plant construction. Construction exposure for ABWR and EPR also benefit from being evolutionary rather than revolutionary designs. While ABWR and EPR contactors have stepped up in varying degrees, we do not have enough information on the terms being offered by the AP 1000, ESBWR, or APWR contractors. *How much of these risks a developer is able to assign to vendors and how much cushion is available for risks that are retained by a project will be key drivers of credit quality.* (emphasis supplied)

**Q. When will the likely impacts of the current financial and economic crisis be known?**

A. As this testimony is written, the United States is in a period of extraordinary volatility in the financial markets. Many economists predict a recession, or opine that the United States is already in an economic downturn. Few will attempt to predict with any basis or certainty how deep the downturn will turn out to be, how long it will last, or what impact it will have on future demand and costs related to the Company's proposal, (or to alternatives to the Company's proposal). Few will even attempt to predict when we will have a good idea of the likely course of events.

**Q. Please summarize the risks associated with the Company's current proposal that are not adequately reflected in the Company's filing.**

A. The Company's filing does not adequately take into consideration the risks that (a) its forecast overestimates the level of need for additional resources in its service area, (b) its cost estimate for the preferred option is too low, and (c) any cost estimate for the proposed nuclear generation plants is subject to a great risk of upward adjustment, (d) pursuit of its preferred option will put financial strain on the utility that will translate into

the risk of higher rates for consumers, (e) the generation option chosen by the Company is new and may present construction and operational challenges that cannot be foreseen, and (f) the Company may be unable to complete the plant and put it into operation (at least on time and on budget) for a number of reasons, including difficulty obtaining a Combined. Operating License for the plant(s), the financial stress of the construction costs of two large central-station generators becoming too great for the Company and the service territory, and further financing becoming impossible to obtain on reasonable terms. In addition, the Company's analysis ignores the cost of capital to the consumer, who is being asked to pay for the costs of construction.

## PART THREE: CONCLUSIONS AND RECOMMENDATIONS FOR REGULATORY RESPONSE TO THE SCE&G PETITION

**Q. Please summarize your conclusions in this docket..**

A. I conclude that the filing does not set forth a sufficient basis to support a finding of the prudence of the Company's nuclear generation plans or support pre-completion cost recovery. There are significant risks associated with the Company's present plan that are not adequately explored or valued in the Company's assessment. There are significant alternatives to the two nuclear generation plants at issue in this docket that are not adequately explored or valued in the Company's assessment. In particular, the Company undervalues solar and wind generation options, and demand side management options. DSM planning by the company is inadequate or altogether lacking, as presented in the application and direct testimony. As to the costs of the nuclear option proposed by the Company, SCE&G has understated the likely costs by a significant margin, and fails to adequately capture the risk of even further increases in such costs. The current financial crisis alone raises serious doubts

about the Company's ability to secure financing for the project, and there are other risks to the Company's ability to secure financing.

**Q. Please summarize your recommendations to the Commission in this docket.**

A. Based on my conclusions and testimony above, I recommend that the Commission deny the application, and direct the Company to undertake a thorough and complete resource planning process, with suitable stakeholder input. I recommend the Commission order that, if the company chooses to submit a new application, it must contain (a) an adequate DSM and alternative energy analysis, (b) a new and updated cost estimate for all generation options, including the proposed reactor project, (c) a thorough analysis of the financing of the proposal, including all sources of non-ratepayer financing, details of financing for any joint owner, such as Santee Cooper, and the impact of the economic crisis on the financing of the project and the Company's financial health.(d) an explanation of how the Company would proceed if full DOE loan guarantees are not obtained, (e) analysis of the risks to the Company and consumers from a proposal to invest an amount roughly equal to the net worth of the Company, and (f) how the customers would be protected from

risks accepted by the Company on their behalf, such as large cost escalations.

If the Commission does not wish to deny the application outright, I recommend that the Commission defer the consideration of any pre-completion approval of the Company's plans under Base Load Review pending (a) a return of the financial markets to solvency and stability, (b) a reassessment of the load forecast and financial analysis underlying the plan in light of recent economic events, (c) an adequate assessment of the risks of the present plan, (d) an adequate assessment of the opportunities for other means to meet (updated) forecast needs, and (e) a full opportunity for stakeholder involvement in the Commission's determination regarding any new proposal the Company may make to construct one or more large central-station nuclear generation plants and obtain pre-approval of any associated costs.

If the Commission determines it is appropriate to proceed forthwith to grant the Company's proposal, I recommend that the Commission make it clear that the Company assumes the risks identified in this docket that pertain to its choice of two nuclear generation facilities. That is, if the Commission approves the Company's proposal for a Base Load Review

order, the Commission should determine that no further adjustment to the approved schedule or budget for completion of the plant may be made on account of the risks determined by the Commission to have been inadequately considered by the Company, and that to the extent the Company makes changes to the schedule or the budget as the result of the occurrence of the factor found to pose such a risk, the Company may not seek an increase in rates or extension of depreciation or amortization to recovery any costs above those approved in this docket. Thus, where the Company has publicly projected that construction, financing and operating costs of the proposed nuclear units will not exceed $6.313 billion, the Commission could condition approval of the application on a prohibition on recovery by the Company of any rates higher than the level projected by the Company in this docket.

**Q. Does this complete your testimony?**

A. Yes.

**Exhibit NB-1**


# Nancy Brockway

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## Education

B.A. with honors, 1970, Smith College, Northampton, MA
J.D., 1973, Yale Law School, New Haven, CT

## Employment

Consultant and Principal, NBrockway & Associates, 2003 – 2008
Director, Multi-Utility Research & Analysis, National Regulator Research Institute, 2/08-10/08
Commissioner, New Hampshire Public Utilities Commission (1998-2003)
Member, New Hampshire Site Evaluation Committee (1998-2003)
Utilities consultant and attorney, National Consumer Law Center (1991-1998)
General Counsel, Massachusetts Public Utilities Commission (1989-1991)
Staff Attorney, Assistant General Counsel, Massachusetts Commission (1986-1989)
Hearings Officer, Senior Staff Attorney, Maine Public Utilities Commission (1983-1986)
Executive Director, Maine Legal Services for the Elderly, Inc. (1981-1983)
Staff Attorney, Directing Attorney, Legal Services in NY, MA and ME (1974-1981)

## NARUC and related Committee Memberships and Public Service (1998-2003)

Steering Committee, National Council on Competition in the Electric Industry
ISO-NE Advisory Committee
NEPOOL Review Board Advisory Committee
NARUC Ad Hoc Committee on Competition in the Electric Industry
NARUC Ad Hoc Committee on Committee Structure, NARUC
NARUC Consumer Affairs Committee (Vice-Chair)
Consumer Affairs Committee, New England Conference of Public Utility Commissioners (Chair)
NARUC Committee on Communications
FCC Joint Conference on Accounting
North American Numbering Council (FCC advisors on numbering policy)
NBANC Board of Directors (funds numbering oversight)

**Other Appointments and Professional Activities (1991-1998)**

Chair, PAYS America, Inc., 2004-2008
Independent Conservation & Load Management Expert, Commonwealth Electric Co.
President's Council on Sustainable Development, Energy & Transportation Task Force
California Low Income Governing Board (Advisory Bd. to CPUC on low-income issues)
Massachusetts Energy Facilities Siting Board
Massachusetts Board of Registration of Allied Mental Health Professionals

**Bar Memberships**

New York State (inactive)
Massachusetts
Maine (inactive)

## NANCY BROCKWAY: TESTIMONIES

| Case name | Client Name | Topic | Juris. & Docket No. | Date Filed |
|---|---|---|---|---|
| Nova Scotia Power, Inc. | NS UARB Consumer Advocate | Proposed general rate increase, rate design. | Nova Scotia Utility and Review Board, P-886 | 12/07 |
| Pike County Commissioners v. PCL&P | Pennsylvania Office of the Consumer Advocate | Options to address rate shock in transition to uncapped competitive POLR rates | Pennsylvania Public Utilities Commission, Docket No. C-20065942 | 11/06 (hearing in January 07) |
| Nova Scotia Power, Inc. | NS UARB Consumer Advocate | Extra Large Industrial Interruptible Rates | Nova Scotia Utility and Review Board, P-883 | 8/06 |
| UGI/Southern Union, Proposed Merger | Pennsylvania Office of the Consumer Advocate | Impacts of the Proposed Merger on Ratepayers and Rates, Risks and Benefits of Proposed Merger, Synergies, Reliability | Pennsylvania Public Utilities Commission, Docket Nos. A-120011F2000, etc. | 5/06 |
| SEMCO Energy Services Gas Cost Recovery Plan | PAYS America, Inc. | Relationship Between DSM and Gas Costs | Michigan Public Service Commission, Docket No. U-14718 | 5/06 (not admitted) |
| Re: Electric Service Reliability and Quality Standards | Delaware Public Service Commission | Application of Proposed Rules to Competitive Suppliers and Cooperatives | Delaware Public Service Board, Docket No. 50 | 1/06 |
| Exelon/Public Service Electric & Gas, Joint Petitioners | New Jersey Division of the Ratepayer Advocate | Impacts of Proposed Merger on Service Quality, Reliability, and Gas Safety, and Options to Maintain Historic Standards. | New Jersey Board of Public Utilities, BPU Docket No. EM05020106 OAL Docket No. PUC-1874-05 | 11/05-12/05 |
| Exelon/Public Service Electric & Gas, Joint Petitioners | New Jersey Division of the Ratepayer Advocate | Risks and Benefits of Proposed Merger of Exelon and PSE&G, Options for Assuring Benefits and Mitigating Risk | New Jersey Board of Public Utilities, BPU Docket No. EM05020106 OAL Docket No. PUC-1874-05 | 11/05-12/05 |
| Nova Scotia Power, Inc. | NS UARB Consumer Advocate | Economic Development Rates | Nova Scotia Utility and Review Board, P-882 | 10/05 |
| Nova Scotia Power, Inc. | NS UARB Consumer Advocate | Revenue Requirements, Cost Allocation, Rate Design, Demand Side Management, Economic Development Rates | Nova Scotia Utility and Review Board, P-882 | 10/05 – 11/05 |
| Bay State Gas Company | Local 273 | Customer Service, Reliability, Low-Income Protections, Revenue Requirements | Massachusetts DTE, Docket No. 05-27 | 7/05 |
| Nova Scotia Power, Inc. | Nova Scotia Utility and Review Board | Domestic Consumer Perspective on Proposed Rate Case Settlement Agreement | Nova Scotia Utility and Review Board, P-881 | 1/05 |
| Cincinnati Bell Alt Reg | Communities United for Action | Universal Service and alternative regulation of telephone service | PUCO, Case No. 96-899-TP-ALT | 12/97 |

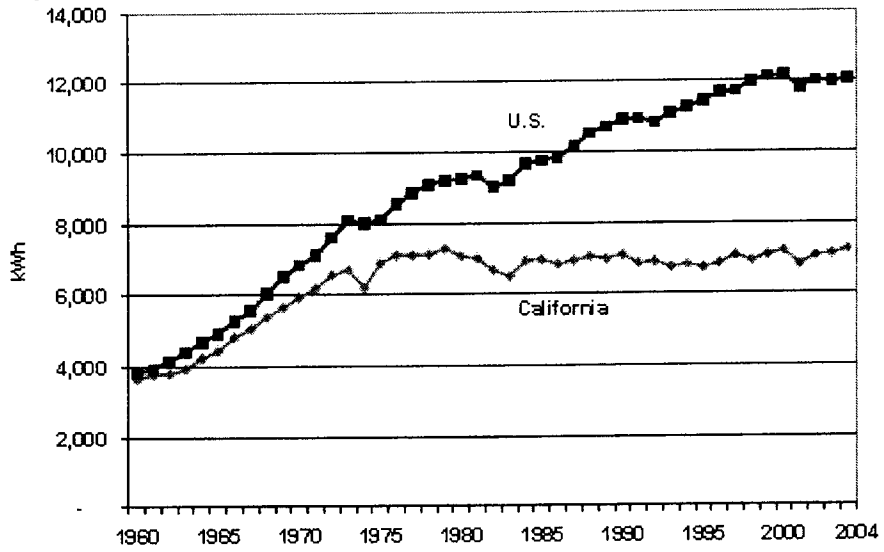
## NANCY BROCKWAY: TESTIMONIES

| | | | | |
|---|---|---|---|---|
| UGI-Electric Utilities, Inc. | Pennsylvania OCC | Universal Service issues in electric industry restructuring plans | PA PUC, No. R-00973975 | 1997 |
| West Penn Power Co. | " | " | PA PUC, No. R-00973981 | 1997 |
| Duquesne Light Co. | " | " | PA PUC, No. R-00974101 | 1997 |
| PECO, Inc., | " | | PA PUC, No. R-00973953 | 1997 |
| PP&L | " | " | PA PUC, No. R-00973954 | 1997 |
| Met Ed. | " | " | PA PUC, No. R-00974008 | 9/97 |
| Penelec | " | " | PA PUC, No. R-00974009 | 9/97 |
| In the Matter of the Electric Industry Restructuring Plan | New Hampshire Legal Services | Low-income rates and DSM, impacts of restructuring on low-income consumers | New Hampshire Public Utilities Commission, D.R. 96-150 | Nov., Dec. 1996 |
| Notice of Inquiry/ Rulemaking. establishing the procedures to be followed in electric industry restructuring. | Mass. CAP Directors Association, Mass. Energy Directors Association, named Low-Income Intervenors | Electric industry restructuring | Massachusetts Department of Public Utilities, D.P.U. 96-100. | to 10/98 |
| Universal Service Docket | Pennsylvania Office of Consumer Advocate | Rate rebalancing, universal service, telephone penetration. | Pennsylvania Public Utilities Commission Docket No. I-00940035 | 1996 |
| In Re: Complaint of Kenneth D. Williams v. Houston Lighting and Power Co. | Named Low-Income Consumers | Customer service, rate design, demand-side management, revenue requirements | Texas Public Utilities Docket No. 12065 | 1994-5 |
| Open Access Non-Discriminatory Transmission Services ... and Recovery of Stranded Costs | Direct Action for Rates and Equality, Providence, Rhode Island | Open transmission access in interstate commerce, and stranded costs recovery. | FERC, Nos. RM95-8-000, RM94-7-000. | 1994-5 |
| Bath Water District, Proposed Increase in Rates | Maine Office of Public Advocate | Water district cost allocation, rate design, low-income water affordability | Maine Public Utilities Commission, Docket. No. 94-034 | 12/94, 3/95 |
| Application of Ohio Bell Telephone Co. for Approval of Alternative Form of Regulation | Legal Aid Society of Cleveland and Dayton | Definition of universal telecommunications service, proposal for Universal Service Access program (USA). | Public Utilities Commission of Ohio, Case No. 93-487-TP-ALT | 5/4/94 |
| Pennsylvania PUC vs. Bell Telephone of Pennsylvania | Pennsylvania Public Utility Law Project | Definition of "universal telecommunications service" | Pennsylvania PUC No. P-930715 | filed 12/93 |

## NANCY BROCKWAY: TESTIMONIES

| | | | | |
|---|---|---|---|---|
| Joint Application for Approval of Demand-Side Management Programs, etc. | LG&E; Legal Aid Society of Louisville, other Joint Applicants | Cost-effective DSM programs for low-income customers; collaborative process to design DSM programs; cost allocation and cost recovery. | Kentucky PSC No. 93-150 | 11/8/93 |
| Texas Utilities Electric Company | Texas Legal Services Center | Costs and benefits of DSM targeted to low-income customers | Texas PUC No. 11735 | 1993 |
| Texas Utilities Electric Company | Texas Legal Services Center | Proposed Maintenance of Effort Rate for low-income customers | Texas PUC No. 11735 | 1993 |
| Philadelphia Water Department | Philadelphia Public Advocate | Costs of Unrepaired System Leaks | Philadelphia Water Comm'r. | 1992 |
| New England Telephone | Rhode Island Legal Services | DNP for non-basic service | Rhode Island PUC, No. 1997 | 1991 |
| Kentucky Power Co. | Kentucky Legal Services | Low Income Rate | Kentucky PSC No. 91-066 | 1991 |
| Investigation into Modernization | Invited by Commission | Impact of modernization costs on low income telephone users | New York PSC | 1991 |

**Comparison of Per Capita Electricity Consumption in U.S. and California**




Source: California Energy Commission, 2005

**Exhibit NB-3**

## Table 1: Energy Savings (Conservation) Performance of Large Utilities, 2006

| Utility | State | Ownership | Total Sales gWh | Annual DSM Savings gWh (%) |
|---|---|---|---|---|
| Massachusetts Electric | MA | IOU | 12,990 | 257 (1.98%) |
| Connecticut Light & Power | CT | IOU | 22,109 | 265 (1.20%) |
| Pacific Gas & Electric | CA | IOU | 76,817 | 780 (1.01%) |
| Southern California Edison | CA | IOU | 78,863 | 788 (1.00%) |
| Interstate Power and Light | IA | IOU | 16,026 | 134 (0.84%) |
| Puget Sound Energy | WA | IOU | 21,092 | 166 (0.79%) |
| Sacramento Municipal Utility | CA | Municipal | 10,799 | 79 (0.73%) |
| Northern States Power | MN | IOU | 35,923 | 258 (0.72%) |
| Nevada Power Company | NV | IOU | 21,101 | 146 (0.69%) |
| MidAmerican Energy | IL | IOU | 23,389 | 156 (0.67%) |
| Wisconsin Power & Light | WI | IOU | 10,580 | 66 (0.63%) |
| City of Seattle | WA | Municipal | 9,455 | 52 (0.55%) |
| Idaho Power | OR | IOU | 13,939 | 71 (0.51%) |
| Long Island Power Authority | NY | State | 18,354 | 92 (0.50%) |
| PacifiCorp | WY | IOU | 51,797 | 193 (0.37%) |
| Arizona Public Service | AZ | IOU | 27,970 | 80 (0.29%) |
| Wisconsin Electric Power | MI | IOU | 28,189 | 68 (0.24%) |
| Public Service Elec & Gas | NJ I | IOU | 34,354 | 68 (0.20%) |
| Florida Power & Light | FL | IOU | 103,653 | 200 (0.19%) |
| Tennessee Valley Authority | TN | Federal | 33,008 | 61 (0.19%) |

Source: Energy Information Administration, Form 861 Database.
Note: Large utilities are defined as the 100 utilities with the largest total electricity sales.